



WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: 2005NC49B

Title: A Comparison of Drought Tolerance in Common Herbaceous Wetland Macrophytes as Indicated by Plant Growth, Water Status, and Oxidative Stress

Project Type: Research

Focus Categories: Wetlands, Drought

Keywords: Aquatic plants, conservation, drought, lakes, landscape management, plant growth, plant stress, plant-water relationships, reservoir management, riparian vegetations, wetlands

Start Date: 03/01/2005

End Date: 02/28/2006

Federal Funds: \$9,341

Non-Federal Matching Funds: \$18,682

Congressional District: 6

Principal Investigator:

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Abstract

In managed reservoirs, during drought periods, water levels can decrease to the point where areas that would normally support highly diverse wetland ecosystems could undergo significant water deprivation that prevents the establishment / maintenance of common wetland flora. In some reservoirs, there is little to no obligate herbaceous wetland vegetation within the littoral zone, and this is likely due to the inability of the reservoir to maintain suitable water levels. In contrast, other reservoirs, such as Badin Lake, undergo less extreme water fluctuations and can therefore sustain only monocultures of *Justicia americana* L. Our ongoing working hypotheses, consider these monocultures to be associated with periodic water withdrawal in the reservoir, and are likely due to the ability of *J. americana* to tolerate short-term periods of water deprivation (days to weeks). Moreover, because other obligate emergent lacustrine species are less tolerant to water deficit, they are not able to compete with *J. americana*, thereby preventing the establishment of a highly diverse wetland system. Only a few studies have considered drought tolerance on inland freshwater vegetation. Therefore, the proposed research will focus on vegetation responses - including alterations in biomass /

productivity, water status, and oxidative stress physiology on five common herbaceous wetland plants (*Justicia americana*, *Saururus cernuus*, *Iris virginica*, *Peltandra virginica*, and *Decodon verticillatus*). This study would not only allow us determine relative drought tolerance in prominent wetland plants, but would also provide lake and reservoir managers needed data to better protect lacustrine wetlands during drought periods. Moreover, for reservoirs that must undergo fluctuations in water levels, this study could target plants that are best suited for establishing littoral wetlands, thereby enhancing overall diversity and productivity of the shoreline.